

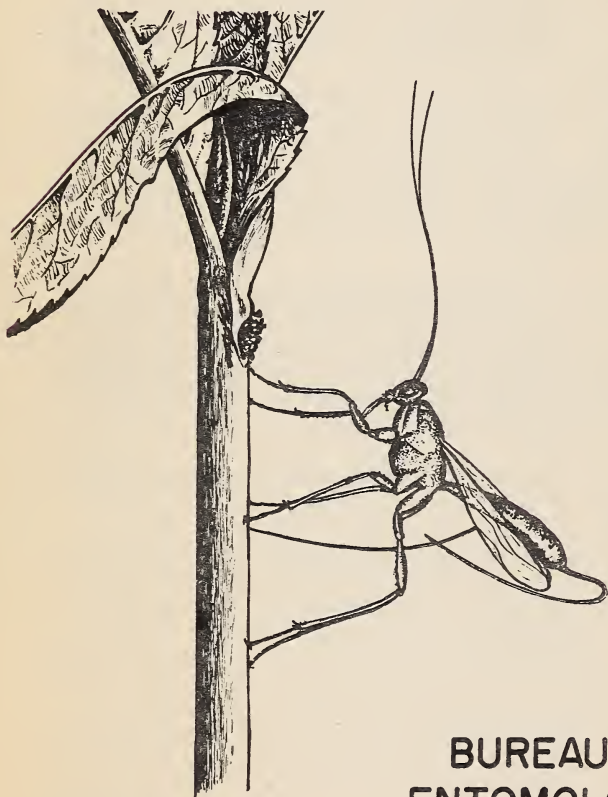
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HOW TO USE PARASITES *against the* ORIENTAL FRUIT MOTH



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HOW TO USE PARASITES AGAINST THE ORIENTAL FRUIT MOTH

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Parasites have been used successfully in reducing oriental fruit moth injury in peaches for the last 10 years. During this period 100 to 140 acres of peaches have been treated on an experimental basis each year. Injury in these orchards has been reduced 80 percent under the best conditions, and the average has been a little less than 50 percent. Parasites have been the only available means of control during most of this period. Recently they have been used in a control program with DDT. The parasite is a small, slender, amber-colored, wasplike insect called Macrocentrus ancylivorus Roh., which is now being produced in large numbers in several commercial and government laboratories.

To be successful, the liberations of this parasite must be planned and carried out as carefully as a spray schedule. The parasites must be liberated at the right time, there must be enough of them, and they must be active and vigorous at normal summer temperatures.

As a concrete example, let us consider the proposed treatment of a 20-acre block of peaches located in Pennsylvania or New Jersey. This orchard lies within the area in which this parasite is known to work successfully—roughly, Massachusetts to Michigan and southward to eastern Missouri, Arkansas, and northern Georgia. It has been decided that in this orchard parasites should be liberated at the rate of about six females per tree against the second brood. Experience has shown that this number gives the best results, although as few as three females per tree have been used. The female parasite has at the rear of its body a threadlike extension, about the same length as the body, with which it places the egg in the larva of the fruit moth.

We must plan the liberations so that there will be many active parasites in the orchard while the second-brood worms are present. Since the worms of this brood are abundant for about 3 weeks, and the parasites are usually effective for only a few days, it is necessary to keep the supply up by repeated liberations. We advise five

liberations at 4-day intervals. These releases should start as soon as the young larvae of this brood begin to enter peach twigs. Since the infestation builds up to a peak and then recedes, the liberations should start and end with small numbers, most of the parasites being used at the peak of the infestation. Of the whole number released, we plan to liberate the following percentages in each of the five successive releases: 10, 20, 35, 25, and 10.

It is highly important to know when the second-brood infestation starts in each locality, and frequently local experiment stations can help in determining this. The best available information indicates that in this orchard it starts about June 27. Since the orchard contains 2,000 trees, we shall require 12,000 female parasites, to be liberated as follows: June 27, 1,200; July 1, 2,400; July 5, 4,200; July 9, 3,000; and July 13, 1,200. If the season is unduly retarded, parasite deliveries for liberation should be delayed for a few days, and if the infestation starts earlier than expected, parasite shipments should be likewise advanced. The degree of control obtained will be determined largely by the accuracy of timing in relation to the second-brood infestation. Since parasites are usually shipped with about equal numbers of females and males, a total of 24,000 will be required for the orchard if 6 females per tree are used.

Some growers prefer to use parasites against both first- and second-brood fruit moths. In southern New Jersey about the same results have been obtained from liberations against both broods as when the liberations were made against the second brood only. When liberations are to be made against both broods, half the total number to be released should be used against the first brood, which occurs in May and early June, and the remainder against the second brood, the same procedure to be followed for both broods as described above.

In southern New Jersey the most favorable period for first-brood liberations is usually about May 20 to June 10, and for second-brood liberations from June 25 to July 15. Southward it is earlier, and northward or at higher elevations it is somewhat later.

Parasites used in releases should be vigorous and active at 70° F. or above. They should

always be shipped with food, if the interval between assembling and release is more than 24 hours, since without it they die in a short time. Parasites that have been properly cared for can be used when they are more than 5 days old, but the number should be increased. During storage or while being transported, they should never be exposed to excessive heat or dryness. If carried in an automobile, the units should be put in a clean box, or basket, with a little ice, or wrapped in a clean wet cloth, but water should not be allowed to drip or drain into the shipping units. Dry ice should never be used to keep parasites cool. If more than 10 percent of the parasites in the shipping container are dead at the time of liberation, the survivors will be of questionable vitality and value.

Each time parasites are released they should be scattered widely over the orchard. This can be accomplished by walking slowly about through the orchard carrying the shipping containers and opening them to permit the parasites to fly away. The parasites can be released at nearly any time of day, but preferably not at midday when the weather is very hot and dry, or during a heavy rain. If parasites must be kept a day or two before release, they should be stored in a refrigerator at temperatures several degrees above freezing, but the containers should be taken out of the refrigerator for an hour each day to allow the parasites to warm up and feed.

The Macrocentrus parasite cannot be used successfully against the oriental fruit moth infestation that occurs late in the season; hence it should not be adopted as a means of control for peach varieties ripening later than Elberta and Hale. When parasites are used in programs along with DDT, applications of the insecticide should not be started until 5 days after the last parasites have been released, lest the parasites be destroyed before they have had a chance to do their work. Since benzene hexachloride, which is used for plum curculio control, is also extremely toxic to this parasite, this insecticide should not be applied during the period of parasite release or for several days before and after.

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